A Study on Attendance and Academic Achievement

Abstract

In this study we attempt to answer Romer's (1993) question: "Should attendance be mandatory?" Contrary to many existing studies, we conclude that in the case of business and management programs the answer is 'no'. In a study of over 900 undergraduate strategy students, spanning four academic years, we examine the link between attendance and exam results. Unlike prior research on this topic, our findings show that attendance is not the best determinant of student performance. We find instead that the best determinant of student performance for third year bachelor students is their over-all degree classification, which we see as a proxy for academic ability. We suggest that attendance may simply be a reflection of student conscientiousness, engagement and motivation. We also challenge the assumptions about gender differences found in prior research on student attendance and student performance. We do not find such differences to be consistently significant in our study.

A Study on Attendance and Academic Achievement

Introduction

Absenteeism is a recognized and concerning problem in universities around the world (Devadoss & Foltz, 1996; Newman-Ford, Fitzgibbon, Lloyd, & Thomas, 2008; Romer, 1993). Despite this, the effects of absenteeism on student performance in business schools have received only relatively limited attention in the higher education literature. The general conclusion from studies in other subject areas is that there is a positive and statistically significant effect of attendance on student performance (Chen & Lin, 2008; Devadoss & Foltz, 1996; Kirby & McElroy, 2003; Lin & Chen, 2006; Shimoff & Catania, 2001; van Walbeek, 2004). However, existing studies have also been criticized for being inconsistent in terms of methodology (Newman-Ford, Fitzgibbon, Lloyd, & Thomas, 2008), and there is growing evidence of the need to differentiate between subject areas in this type of study (Fielding, Charlton, Kounali, and Leckie, 2008). A further complication is the variety of different ways we examine students. The attendance effects on achievement on a simple recall multiple-choice exam might be very different from the effects on, for example, a written assignment. It is therefore highly uncertain whether we can generalize anything from existing studies in other subject areas. Yet, the issue is critical as many business schools grapple with the question of whether or not to make attendance mandatory.

Low attendance levels appear to have become a fact for many university lecturers. Worryingly, it may be the weaker students who choose to skip lectures, even if they are the ones who would potentially benefit the most from attendance (van Walbeek, 2004). Reported numbers vary from 60-90% average class attendance rates in the literature (Lin & Chen, 2006; Marburger, 2006; Romer, 1993). A lack of participation in the learning community is often taken as an indication of low student engagement (Horstmanshof & Zimitat, 2007), a feature more common of city universities, where campus life tends to be less evolved (Pike & Kuh, 2005). In the case of universities with a highly diverse student body, one might be tempted to attribute differences in student engagement to particular student background characteristics. However, existing studies have found that background characteristics (such as gender, minority status, or entering ability levels) generally account for only 1–5% of the variance in levels of engagement (Pike & Kuh, 2005). Other reasons for non-attendance cited in the literature include the quality of teaching and the scheduling of classroom activities.

In the largest ever study linking background characteristics to degree attainment, a study of over 66´000 students commissioned by the UK's Higher Education Academy, Fielding, Charlton, Kounali, and Leckie (2008) reported significant differences in how gender and ethnicity interact with degree attainment between degree subject areas. For example, they report that female students generally achieve higher degree classifications, except on business and management degrees, where gender effects appear insignificant. Such results highlight the need to differentiate between subject areas, but also the importance of controlling for such things as

gender effects, scheduling, and teacher, when studying the link between attendance and achievement.

In this paper, we report the results of a study of four cohorts of students on a final year undergraduate strategy course, linking attendance to exam results. By introducing controls for such things as timetabling and gender, we propose a more complete model than that found in most existing studies. Whilst we do find that over-all degree achievement, achievement on this particular course, and levels of attendance may be associated, once interaction effects are taken into account, we can conclude that the only clear predictor of achievement on a particular course, is a student's general academic level of achievement. We find that students who perform well on a given course also have a higher average attendance rate. However, these same students generally perform well in their studies, and will tend to do so regardless of their actual level of attendance, whilst students who do not do so well generally will tend to attend classes less, but attending more would not significantly improve their results. This contradicts the implications commonly reported in the literature and suggests that making attendance mandatory is unlikely to raise over-all levels of achievement.

Attendance and Student Achievement

Several studies have attempted to measure the impact of attendance on student performance (Romer 1993; Park and Kerr 1990; Durden and Ellis 1995; Schmidt 1983; Marburger 2001). Each of these studies has found that a significant positive correlation between attendance and exam performance, suggesting that attendance is an important facilitator of academic success. For example, Romer (1993) surveyed attendance at all undergraduate economics classes during one week at a large public institution, a medium-sized private university, and a small liberal arts college. He concludes that a significant link exists between absenteeism and learning (Romer 1993). Marburger (2001) investigated the relationship between absenteeism and student performance by surveying a single section of students attending a principles of microeconomics class. He found that daily absenteeism on any given day ranged from 8.5 percent to 44.1 percent. He concludes that students who had a missed a class on a specific day were 7.5 to 14.6 percent more likely to respond incorrectly to a multiple choice question on material covered that day when compared to students who were present (Marburger 2001). In a follow up study, Marburger (2006) investigated the impact of enforcing an attendance policy on absenteeism and student performance. Once again the context was a microeconomics class but this time split over two fall semesters. Both classes used the same teaching material and teaching staff. One class had a mandatory attendance policy while the other did not. He concludes that an enforced mandatory attendance policy reduces absenteeism and improves exam performance.

In light of these studies, it seems clear that attendance improves student performance. However, the evidence may not be as conclusive as suggested in such studies. Some studies

exploring the attendance-achievement relationship have been far less certain about the link between attendance and performance, showing that this relationship is neither linear nor automatic (Baldwin 1980; Gatherer & Manning 1998). In other words, the statistical significance is not particularly strong. Even Marburger (2006) commented that 'whereas the relationship between a mandatory attendance policy and learning is statistically significant, the impact does not appear to be substantial. During the final third of the semester, when the absenteeism gap between the policy and no-policy classes was greatest, a student in the no-policy class was only 2 percent more likely to respond incorrectly to the average multiple-choice test question than was a student in the policy class.' (2006, pp. 154). The evidence thus appears rather more inconclusive once scrutinized. In fact, none of the findings suggest that lecture attendance is either necessary or sufficient in support of academic performance (Moore, Armstrong & Pearson 2008). If the evidence is inconclusive then a next question for this research could be what factors actually drive student performance?

Student Motivation

What actually motivates a student to attend scheduled classes or not remains a relatively unexplored area (Woodfield, Jessop, & McMillan, 2006). One perspective on the discussion is that lecture attendance may simply be a proxy for student motivation, conscientiousness and diligence. Non-attendance may be a signal of low motivation. What evidence there is suggests that students who attend lectures and seminars are those who are more likely to be motivated, subscribe to, and understand the benefits of active participation, have strong time management skills, and are likely to conform to the institution's expectations of them (Moore, Armstrong, Pearson, 2008). In effect, what drives performance in class may not be attendance, but a student's motivation and personality. Attendance is in this perspective simply a proxy that measures their level of internal drive or motivation. Personality drives student behavior and then maintains this behavior over longer periods. These sets of behaviors go to the heart of motivation theory (Morley, Moore, Heraty, MacCurtain, & Linehan, 2004). Students who attend lectures and seminars are those who are also more likely to work harder in assignments, and engage more actively with the topics presented to them.

In their study of 230 undergraduate students Moore et al. (2008) found that 60 percent of respondents mentioned incongruous reasons for non-attendance like 'my housemate borrowed my alarm clock and I didn't wake up for my 9 o'clock class' and 'only lecture that day'. The authors concluded that that these reasons lacked validity and in fact were likely a signal of the student's own low level of motivation. The authors found that students who reported low motivation reasons for non-attendance also reported a lower percentage of lectures attended across their course of study.

Whilst systematically recording personality and motivation profiles of students may be impractical, it seems clear that any research on the topic should go beyond analyzing the simple linear relationship between attendance and performance of students in a single class (an obvious limitation in for example Marburger's (2001; 2006) method). Any research on the topic should try to take account of student performance over longer periods, or their entire degree, as captured

for example in over-all grade averages, or degree classifications. Furthermore, there are a number of other factors worth considering when engaging in research on student motivation, attendance and performance. The literature mentions factors such as class scheduling, quality of teaching (tutoring), and gender of respondents (Moore et al. 2008; Felding & Charlton, HEA Report, Unknown). We will discuss each of these factors briefly.

Scheduling of classes

Scheduling of classes refers to both the day and time of the learning episode. The idea behind a scheduled lecture or seminar is that it serves to create traction for learning within the student schedule (Moore et al. 2008). The main problem with scheduling is that some studies have found that scheduling may affect attendance. For example, Marburger (2006) found that absenteeism was significantly higher on Fridays and the percentage of students absent from class gradually increased as the semester progressed. He concludes that there appears to be an opportunity cost to attending classes. Students choose from competing academic (write up assignments on Thursday evening) and non-academic (beer on a Friday evening) uses of their time, when determining whether to attend class or not. Controlling for scheduling effects may therefore be useful in studies of attendance and student achievement.

Teaching (tutor) quality

Tutor quality is another factor worth considering when analyzing the relationship between attendance and achievement. Tutor quality refers to the teacher's ability to engage students in a useful learning episode. Students must perceive that the learning episode they are participating in is worthwhile, relevant or useful as an experience (Moore et al. 2008). As Baldwin (1980) suggested, attendance could be correlated with the perceived value of lectures on the part of students. If lectures are not perceived as worthwhile, relevant, or useful learning experiences, students will be less likely to attend. In their study, Moore et al. (2008) found that some respondents mentioned reasons for absenteeism such as 'don't like lecturer'; 'It is a double lecture'; 'too long'; 'too boring'; 'Lecturer only reads slides'. This suggests that the inclusion of some sort of control for tutor quality is necessary in studies covering multiple classes with different tutors.

Gender

Gender is another factor worth considering when analyzing the relationship between attendance and student performance. In what is probably the largest such study, Fielding, Charlton, Kounali, and Leckie (2008), commissioned by the Higher Education Academy of the United Kingdom (HEA), and using data from the Higher Education Statistics Agency (HESA) and the National Student Survey (NSS), investigate issues relating to differences in degree attainment between males and females, as well as different ethnic groups. Their initial analysis finds that females generally perform better than males in higher education, echoing results found in a number of other studies (Woodfield, Jessop, and McMillan, 2006). Females are also reported to have an advantage over males in getting "first class" degree classifications. However, they do

mention that there is evidence that gender differentials in higher education attainment vary significantly according to subject area. In some subjects there seems to be a female advantage, and in other subjects not so. They thus mention that it is 'unduly simplistic to take as a stylised fact the net female advantage overall' (Fielding, Charlton, Kounali, and Leckie (2008), pp. 67). Females seem to be more advantaged relative to males among the sciences, Engineering and related subjects, and Computer Science (the reference main effect), and less so or even reversed in subjects such as Social Studies, Law, Business Studies, Languages, Historical and Philosophical Studies, and Creative Arts and Design. This is an interesting finding extracted from a very large database that is directly relevant to our study as we analyze the performance of students on a final year undergraduate course in strategy. The finding mentioned above puts us in a position to either support these findings of the HEA report, or not.

Method

In order to explore the attendance-achievement relationship we collected data pertaining to four consecutive cohorts of students on a final year undergraduate course in strategy, at a large London-based university. We included only students who at the time of sampling had completed their studies and been awarded an exit award. The resulting total sample size was 911 students. The course involved a weekly plenary lecture taught by the faculty member responsible for the course. This was most weeks followed or preceded by a seminar, taught by a number of different tutors, in smaller groups of between 20 and 30 students. Some seminars were dedicated to coursework, but a majority involved case discussions. The case method was used in a way where students were asked to read a case prior to class, and think about some related questions. In class, students would then discuss the case in groups, before a plenary discussion, moderated by the tutor. Following the first week or two, students remained in their assigned seminar group for the rest of the course, which spanned two semesters, with 22 weeks of teaching in total. Assessment on this course consisted of a mix of group coursework, participation, individual assignments and a final written two-hour exam. The final exam consisted of a case, which students were given to read in advance, and a number of undisclosed questions that students had to respond to in a closed-book exam setting. Assessment elements other than the exam varied somewhat from year to year. Details are provided in Table 1, along with some student demographics. We created a number of different variables for our analysis, the details of which are given below.

Student identifier and gender. We used university student numbers as unique identifiers and consulted the university's student records to record gender (M/F).

Academic year. We recorded the academic year the student first attended the course, and in the case of re-examination recorded only the results of the first exam sitting. If a student took the entire course a second time, only the first year's records were used.

General academic ability. A commonly used control variable in this type of study is academic level at entry. In the case of UK universities this is sometimes coded as the UCAS (Universities and Colleges Admissions Service) entry score. One of the problems of using this method in our case is that the course we are studying is a final year course. Hence, two years have passed at least since the UCAS score, and significant learning activities have taken place since. For this reason, we decided instead to use the final degree classification as a general proxy for over-all

academic ability. The classification provides a measure of average student achievement over the final two years of study. The scheme used by the university in question is given in Table 2, which shows the equivalent in EU and US systems. Students were classified as "first class", "upper second class", "lower second class", "third class", and in the case of missing credits, "ordinary degree". In a few exceptional cases students failed to achieve sufficient credit, and received only a diploma or certificate. For the sake of our analysis, ordinary degree and other exit awards were lumped together in a single "other" category. The reasoning was that these students all had in common a lack of credits, typically due to failing courses repeatedly.

Tutor. The quality of teaching is a commonly cited reason for students to attend class, and could arguably influence the quality of learning. We therefore recorded the names of tutors and created dummy variables for these.

Scheduling day. Scheduling times are sometimes given as reasons for higher or lower attendance rates (Marburger, 2006). We therefore recorded the day seminars were scheduled (Monday to Friday), and again created a series of dummy variables for these.

Scheduling time. Similar to above, we also recorded the times seminars were scheduled. To simplify the analysis, we chose to code the seminar times as "early AM" (for a class start anywhere between 8 and 10am), "late AM" (for a class start later than 10am but before 12noon), "early PM" (for a class start later than 12noon but earlier than 3pm), and "late PM" (for a class start at 3pm or later).

Attendance level. We measured attendance for three of the four cohorts, based on attendance records kept by seminar tutors. These were expressed in percentage terms. It should be noted, as outlined in Table 1, that for the fourth cohort the attendance mark was a mixture of preparation, attendance, and participation in class. For the first cohort, attendance scores were not kept.

Exam grade. The exam grade was recorded in percentage terms. The scale is from 0 to 100% and the pass level was 40%.

Final grade. We included in our data set the final course grade, expressed in percentage terms. This was to capture over-all achievement on the course, and therefore included the results of other assessment. The scale is from 0 to 100% and the pass level was 40%.

Tables 1 and 2 about here

Analysis

An initial exploration of the dataset involved visual and statistical inspections of the distributions of the continuous variables attendance and exam grade. We identified a small number of outliers with very low exam or attendance scores, but decided to keep these in the sample. There were also a few missing data points and as previously noted, attendance levels were not collected at all for the 2010/11 cohort. We nevertheless kept this cohort in the dataset as we used it to test for other effects on exam results, such as gender effects. To test for normality

in the distributions, we combined a visual inspection with a Kolmogorov-Smirnov test for normality. For the sample as a whole, normality of the two continuous variables was not respected. However, initial inspections also revealed a significant cohort effect, such that, for example, mean exam scores varied significantly between years. Cohort effects could cover a variety of differences between years, including differences in scheduling, tutors, rooms, academic level at entry, cases studied in class, final exam difficulty, and more. We therefore split the sample into the four cohorts. This time, the tests showed a borderline satisfactory result for all cohorts concerning the dependent variable, final exam grade, indicating we could use linear modeling for the further examination of the various hypotheses. The results for each year along with descriptive statistics are found in Table 3.

Tables 3 about here

For attendance scores we found significant skews in the data. Attendance scores indicated a peak at 100%, confirming our own observations over the years that some students choose to attend all lectures and seminars, whilst some choose to attend only a proportion of seminars. The distribution for the 2013/14 cohort differed from the two previous years, due to the slightly different way of registering attendance. The score here is a combination of attendance and participation in class. We see this as a useful proxy for participation in the learning activities, but the measurement differs from the more straightforward attendance scores of the previous years, and attendance therefore cannot directly be compared between years. We constructed a series of dummy variables to control for gender, general academic achievement (classification), tutor and timetabling effects. We then constructed linear multiple regression models for each cohort with exam score as the dependent variable and verified if residuals were normally distributed for all these models, which they were. Table 4 outlines the regression model results for each of the four cohorts.

Although attendance and exam scores were positively and significantly correlated for all three cohorts with reported attendance levels (r^2 = 0,34, r^2 = 0,25, and r^2 = 0,16, respectively), the full regression models showed that once the various covariates were introduced into the model, the effect was to eliminate the attendance effect. The explanation for differences in exam scores is therefore found elsewhere than in a simple linear relationship with attendance. This makes intuitive sense, since the learning benefits of attendance are likely to be unequally distributed among students. In other words, not all students benefit in the same way from attending class. The models in Table 4 do reveal a systematic effect linked to over-all academic achievement, which simply shows that general academic achievement is a good predictor of achievement on a given course. Gender was not a significant and systematic predictor of exam result.

To test for group differences in the link between attendance and exam score, we divided the 2011/12, 2012/13, and 2013/14 cohorts according to general academic achievement (degree classification). For the highest achievers, the ones with a first class honours classification, the only significant effect was a gender effect for the 2013/14 cohort, where female students scored

on average 9.4% higher on their final exam ($p<0.01$). For the upper second class honours students, there was a small positive attendance effect for the 2012/13 ($p<0.05$) and 2013/14 cohorts ($p<0.1$). For the lower second class honours students, there was surprisingly a very small but statistically significant negative attendance effect for the 2012/13 and 2013/14 cohorts ($p<0.05$). For third class honours students there were no statistically significant gender or attendance effects.

Discussion

The results of the regressions point to several important conclusions. First and foremost, the relatively numerous studies that have reported straightforward linear correlations between attendance and student achievement must be viewed with great caution, as reported correlations most likely are the results of uncontrolled for interactions of other variables, rather than true measures of causality. What our study shows clearly is that once controls for such variables as gender, general academic levels of achievement, tutor, or timetabling are taken into account, the statistical association between attendance and academic achievement on a course may change dramatically. Attending classroom sessions, particularly where inductive learning is used as part of the teaching strategy should be beneficial to students. Our data shows clearly that over-all achievement, achievement on any particular module, and levels of attendance may be associated, as can be seen in Table 5. However, once interaction effects are taken into account, as with our more completely specified multiple regressions, what we are left with is a conclusion that the only clear predictor of achievement on a particular course, is a student's general academic ability. Students who generally perform well in their studies will tend to do so regardless of their actual level of attendance, and students who do not do so well, generally will tend to attend classes less, but attending more would not necessarily improve their results.

Comparing our results to older studies like Marburger (2006) and Romer (1993) provides an indication that attendance effects are likely to differ depending on the type of exam used. In Marburger (2006) the exam was a multiple choice exam which would have relied on memory recall, whereas the exam in our study was a case study combining some degree of recall and deductive reasoning, with a more inductive problem-solving approach. Students had to apply learned frameworks of analysis, but to a novel problem. Our examination form therefore called for deeper learning, rather than short-term memory recall, which may in fact help explain our inconclusive evidence. Successful students in our sample were likely to apply a much wider set of cognitive schema to the problem-solving in our exam, linked to deeper accumulated knowledge from other courses on their program. An interesting question is therefore whether attendance effects might be cumulative over the years of study.

Our study adds some evidence to the discussion on gender differences in levels of achievement at university level. This discussion has so far been lacking somewhat in empirical support, and what our study shows is that once various control variables are introduced, there are no significant gender achievement differences at this level of study. It is noteworthy that our sample is a group of students on an undergraduate business program, and the results may be

different for other types of degrees. However, our results corroborate the results of Fielding, Charlton, Kounali, and Leckie (2008), who similarly concluded that there are no gender differences in achievement on business and management programs. As an over-all conclusion, it seems unlikely that making attendance mandatory in business schools is by itself the key to enhancing student achievement. Attracting academically able students, and raising their levels of motivation and engagement may be far more fruitful.

References

Allred, B. B., Snow, C. C., & Miles, R. E. (1996). Characteristics of Managerial Careers in the 21st century. *Academy of Management Executive, 10*(4), 17-27.

Baldwin, B. A. (1980). On positioning the quiz: An empirical analysis. *The Accounting Review*, 55(4), 664–671.

CBI (2011) *Working towards your future: making the most of your time in higher education*. London: CBI. Available from: http://aces.shu.ac.uk/employability/resources/CBI_NUS_Employability%20report_May%202011.pdf

Chen, J., & Lin, T. F. (2008). Class attendance and exam performance: A randomized experiment. *Journal of Economic Education, 39*(3), 213-227.

Chia, R., & Holt, R. (2008). The Nature of Knowledge in Business Schools. *Academy of Management Learning & Education, 7*(4), 471-486.

Copley, J. (2007). Audio and video podcasts of lectures for campus-based students: production and evaluation of student use. *Innovations in Education and Teaching International, 44*(4), 387-399.

Devadoss, S., & Foltz, J. (1996). Evaluation of factors influencing student class attendance and performance. *American Journal of Agricultural Economics, 78*(3), 499-507.

Dolnicar, S. (2005). Should we still lecture or just post examination questions on the web? The nature of the shift towards pragmatism in undergraduate lecture attendance. *Quality in Higher Education, 11*(2), 103-115.

Durden, G. C., and L. V. Ellis. 1995. The effects of attendance on student learning in principles of economics. *American Economic Review Papers and Proceedings* 85 (May): 343–46.

Fernandez, V., Simo, P., & Sallan, J. M. (2009). Podcasting: A new technological tool to facilitate good practice in higher education. *Computers and Education, 53*(2), 385-392.

Fielding, A., Charlton, C., Kounali, D., & Leckie, G. (2008). *Degree attainment, ethnicity and gender: Interactions and the modification of effects. A quantitative analysis*. The Higher Education Academy.

Gatherer, D., & Manning, C. R. (1998). Correlation of examination performance with lecture attendance: A comparative study of first year biological sciences undergraduates. *Biochemical Education*, 26(2), 121–131.

Green, W., Hammer, S., & Star, C. (2009). Facing up to the challenge: why is it so hard to develop graduate attributes? *Higher Education Research & Development, 28*(1), 17-29.

Hilton, M. (2008). Skills for Work in the 21st Century: What Does the Research Tell Us? *Academy of Management Perspectives*(November), 63-78.

Horstmanshof, L., & Zimitat, C. (2007). Future time orientation predicts academic engagement among first-year university students. *British Journal of Educational Psychology, 77*, 703–718.

Hove, M. C., & Corcoran, K. J. (2008). If you post it, will they come? Lecture availability in introductory psychology. *Teaching of Psychology, 35*(2), 91-95.

Kirby, A., & McElroy, B. (2003). The Effect of Attendance on Grade for First Year Economics Students in University College Cork. *The Economic and Social Review, 34*(3), 311-326.

Lin, T. F., & Chen, J. (2006). Cumulative class attendance and exam performance. *Applied Economics Letters, 13*(14), 937-942.

Marburger, D. R. 2001. Absenteeism and undergraduate exam performance. *Journal of Economic Education* 32 (Spring): 99–109.

Marburger, D. R. 2006. Does mandatory attendance improve student performance. *Journal of Economic Education*, 37 (Spring): 148-155

Moore S., Armstrong, C., Pearson, J. (2008). Lecture absenteeism among students in higher education: a valuable route to understanding student motivation. *Journal of Higher Education Policy and Management*, 30 (1): 15–24

Morley, M., Moore, S., Heraty, N., MacCurtain, S., & Linehan, M. (2004). *Principles of organisational behaviour: An introductory text*. Dublin: Gill and MacMillan.

Newman-Ford, L., Fitzgibbon, K., Lloyd, S., & Thomas, S. (2008). A large-scale investigation into the relationship between attendance and attainment: a study using an innovative, electronic attendance monitoring system. *Studies in Higher Education, 33*(6), 699-717.

Park, K. H., and P. M. Kerr. 1990. Determinants of academic performance: A multinomial logit approach. *Journal of Economic Education* 21 (Spring): 101–11.

Pegg, A., Waldock, J., Hendy-Isaac, S., & Lawton, R. (2012). *Pedagogy for employability*. York: Higher Education Academy.

Pike, G. R., & Kuh, G. D. (2005). A Typology of Student Engagement for American Colleges and Universities. *Research in Higher Education, 46*(2), 185-209.

Riffell, S. K., & Sibley, D. F. (2004). Can Hybrid Course Formats Increase Attendance in Undergraduate Environmental Science Courses? *Journal of Natural Resources and Life Sciences Education, 33*(1), 1-5.

Romer, D. (1993). Do Students Go to Class? Should They? *Journal of Economic Perspectives, 7*(3), 167-174.

Rubin, R. S., & Dierdorff, E. C. (2009). How Relevant Is the MBA? Assessing the Alignment of Required Curricula and Required Managerial Competencies. *Academy of Management Learning & Education, 8*(2), 208-224.

Savage, S. J. (2009). The Effect of Information Technology on Economic Education. *Journal of Economic Education, 40*(4), 337-353.

Schmidt, R. M. 1983. Who maximizes what? A study in student time allocation. American Economic Review Papers and Proceedings 73(May): 23–28.

Shimoff, E., & Catania, A. C. (2001). Effects of recording attendance on grades in introductory psychology. *Teaching of Psychology, 28*(3), 192-195.

Simpson, N. (2006). Asynchronous access to conventional course delivery: a pilot project. *British Journal of Educational Technology, 37*(4), 527-537.

van Walbeek, C. (2004). Does Lecture Attendance Matter? Some Observations from a First-Year Economics Course at the University Of Cape Town. *South African Journal of Economics, 72*(4), 861-883.

Walls, S. M., Kucsera, J. V., Walker, J. D., Acee, T. W., McVaugh, N. K., & Robinson, D. H. (2010). Podcasting in education: Are students as ready and eager as we think they are? *Computers & Education, 54*(2), 371-378.

Woodfield, R., Jessop, D., & McMillan, L. (2006). Gender differences in undergraduate attendance rates. *Studies in Higher Education, 31*(1), 1-22.

	2010/11	2011/12	2012/13	2013/14
Male students	92	138	128	159
Female students	63	111	88	132
Total students	155	249	216	291
Number of tutors on course	4	4	3	4
Coursework and weight	Group report and presentation (30%)	Group report and presentation (30%)	Group report and presentation (30%)	Group report and presentation (30%)
Participation measurement and weight	Not measured this year	Attendance and preparation (10%)	Attendance and preparation (10%)	Online group case analysis and individual participation in class discussion (20%)
Final exam and weight	Seen case with un-seen questions (50%)	Seen case with un-seen questions (50%)	Seen case with un-seen questions (50%)	Seen case with un-seen questions (50%)
Other assessment	Online case and MCQ test (20%)	Online MCQ test (10%)	Online MCQ test (10%)	

TABLE 1
Assessment and Demographics

UK University	Percentage Range	US/EU Equivalent
First class honours	70% +	A
Upper second class	60% - 69%	B
Lower second class	50% - 59%	C
Third class	44% - 49%	D
Third class	40% - 43%	E
Fail	0% - 39%	Fail

TABLE 2
Degree Classification

2010/11	N	Mean	Std. Dev.	Skewness	Kurtosis	Kolmogorov-Smirnov test
Attendance (%)	0					
Final Exam (%)	155	51,26	15,227	-,622	,572	,200
2011/12						
Attendance (%)	244	78.59	26.179	-1.076	-.059	,000
Final Exam (%)	244	39,12	12,896	.102	-.404	,052
2012/13						
Attendance (%)	211	76.02	26.856	-.977	-.174	,000
Final Exam (%)	211	33.44	11.191	.341	.123	,062
2013/14						
Attendance (%)	274	57.44	17.703	-.024	.124	,000
Final Exam (%)	274	45.05	13.966	-.299	-.401	,045

TABLE 3
Descriptive Statistics for Continuous Variables

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
2010/11	(Constant)	54,856	2,315		23,699	,000
	Gender (Female = 1)	,929	1,957	,030	,475	,636
	First	11,873	2,892	,278	4,105	,000
	Lower Second	-9,910	2,261	-,296	-4,384	,000
	Third	-22,293	4,163	-,343	-5,355	,000
	Other	-23,334	3,716	-,411	-6,280	,000
	Tutor1	-2,139	5,620	-,061	-,381	,704
	Tutor2	2,433	4,302	,074	,565	,573
	Friday	,580	4,728	,019	,123	,902
	lateAM	-2,593	8,657	-,061	-,300	,765
	latePM	,330	5,558	,011	,059	,953
2011/12	(Constant)	33,385	4,019		8,308	,000
	Gender (Female = 1)	,543	1,343	,021	,404	,686
	First	16,213	4,021	,512	4,032	,000
	UpperSecond	7,952	3,803	,289	2,091	,038
	LowerSecond	-1,405	3,750	-,050	-,375	,708
	Third	-7,714	4,348	-,147	-1,774	,077
	Other	-4,294	4,393	-,079	-,977	,329
	Thursday	5,285	2,992	,095	1,766	,079
	earlyAM	2,806	2,354	,070	1,192	,234
	lateAM	,297	2,187	,008	,136	,892
	earlyPM	-,521	2,236	-,014	-,233	,816
	latePM	-3,717	1,791	-,138	-2,075	,039
	Attendance (%)	,018	,028	,040	,652	,515
2012/13	(Constant)	23,349	6,362		3,670	,000
	Gender (Female = 1)	2,756	1,390	,122	1,983	,049
	First	15,569	5,860	,565	2,657	,009
	UpperSecond	7,354	5,767	,327	1,275	,204
	LowerSecond	4,182	5,842	,162	,716	,475
	Third	1,949	6,877	,031	,283	,777
	Other	,254	6,369	,006	,040	,968
	Tutor1	-10,209	4,658	-,361	-2,192	,030
	Tutor4	2,287	2,221	,095	1,030	,304
	Monday	7,567	5,043	,198	1,501	,135
	Wednesday	-5,603	3,682	-,200	-1,522	,130
	earlyAM	1,646	2,611	,065	,630	,529
	lateAM	5,414	4,074	,197	1,329	,185
	Attendance (%)	,023	,032	,061	,741	,460
2013/14	(Constant)	52,005	4,445		11,700	,000
	Gender (Female = 1)	,823	1,553	,029	,530	,597
	First	4,374	3,746	,126	1,168	,244
	UpperSecond	-2,855	3,420	-,096	-,835	,405
	LowerSecond	-9,179	3,418	-,293	-2,685	,008
	Third	-13,005	4,407	-,222	-2,951	,003
	Other	-20,146	4,640	-,325	-4,342	,000
	Tutor1	-,138	3,300	-,004	-,042	,967
	Tutor5	2,967	4,248	,086	,698	,486
	Monday	5,185	3,553	,111	1,460	,146
	Tuesday	-1,144	3,161	-,024	-,362	,718
	Wednesday	-,019	3,520	-,001	-,006	,996
	Thursday	3,659	2,381	,102	1,537	,125
	latePM	-4,994	2,046	-,176	-2,440	,015
	Attendance (%)	-,033	,047	-,044	-,713	,476

Note: Dependent Variable: Final Exam (%)

TABLE 4
Summary of Regression Models with Variables Predicting Exam Scores

Degree Classification		2011/12 Attendance (%)	2011/12 Final Exam (%)	2012/13 Attendance (%)	2012/13 Final Exam (%)	2013/14 Attendance (%)	2013/14 Final Exam (%)
First Class Honours	Mean	95,58	50,89	91,14	41,98	70,68	53,98
	N	52	52	44	44	58	57
	Std. Deviation	8,023	11,426	14,178	12,676	14,981	11,827
Upper Second Class Honours	Mean	84,81	42,39	80,44	33,79	59,83	46,46
	N	80	80	90	90	95	94
	Std. Deviation	21,953	10,086	23,122	9,884	15,727	13,507
Lower Second Class Honours	Mean	72,34	32,87	69,06	30,26	49,63	39,94
	N	77	77	53	53	77	77
	Std. Deviation	27,429	9,395	28,573	7,899	15,627	12,487
Third Class Honours	Mean	50,63	26,38	57,14	26,86	49,15	36,94
	N	16	16	7	7	17	17
	Std. Deviation	33,560	8,082	34,983	9,805	21,195	8,975
Ordinary Degree	Mean	39,29	28,71	36,67	22,44	44,82	31,70
	N	14	14	9	9	11	10
	Std. Deviation	24,640	8,862	21,213	7,196	13,430	18,294
Total	Mean	77,01	39,10	74,26	33,44	55,56	44,84
	N	249	249	216	216	291	277
	Std. Deviation	28,170	12,896	28,909	11,121	19,798	14,072

TABLE 5
Mean Attendance and Exam Scores by Degree Classification and Year